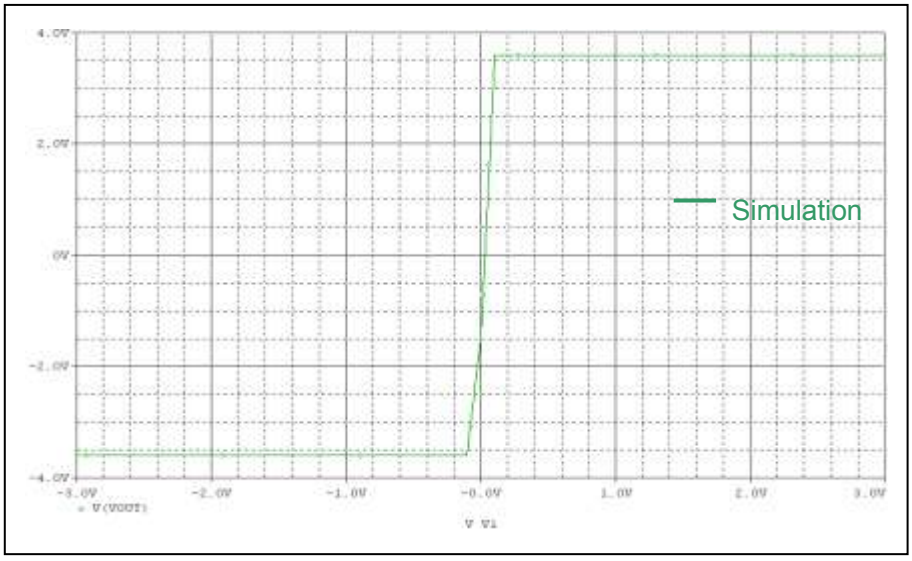
Device Modeling Report

COMPONENTS : OPERATIONAL AMPLIFIER
PART NUMBER : OPA685
MANUFACTURER: BURR BROWN CORPORATION

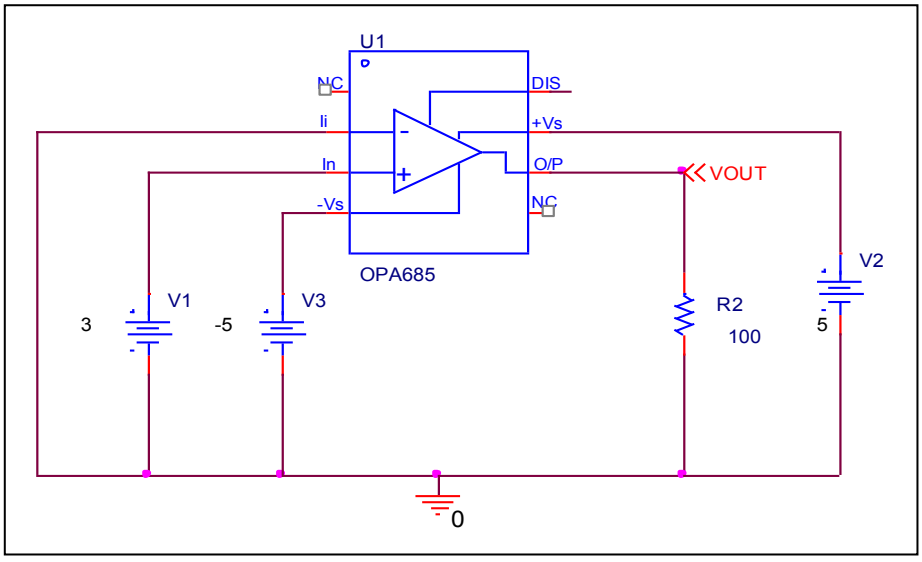
Bee Technologies Inc.

Output Voltage Swing

Simulation result



Evaluation circuit

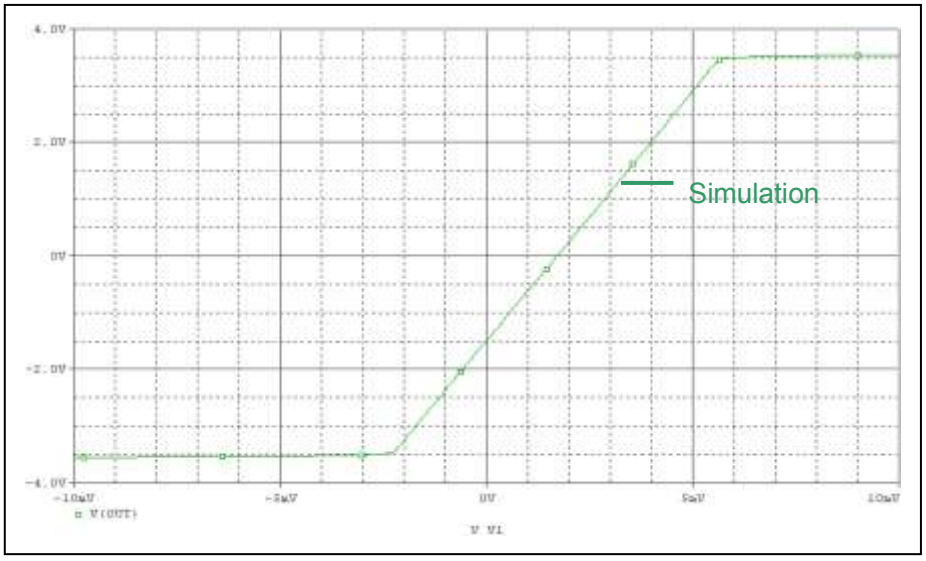


Comparison Table

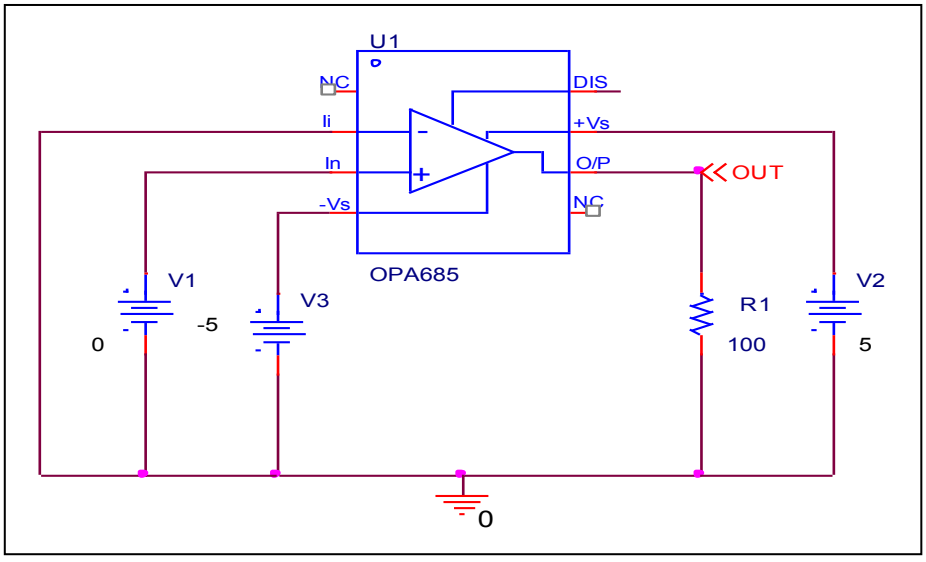
Output Voltage Swing	Measurement	Simulation	%Error
± V_{OUT} (V)	3.6	3.6006	0.017

Input Offset Voltage

Simulation result



Evaluation Circuit

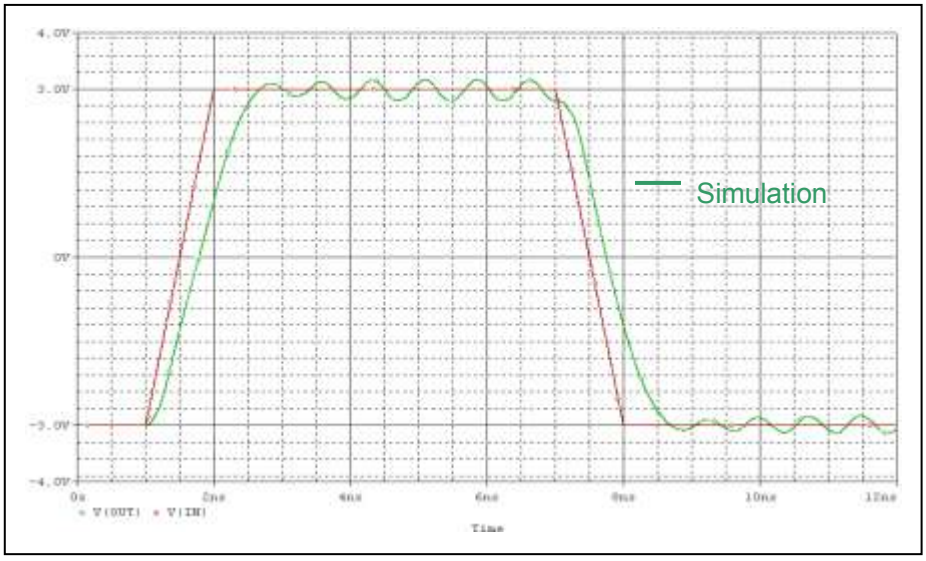


Comparison Table

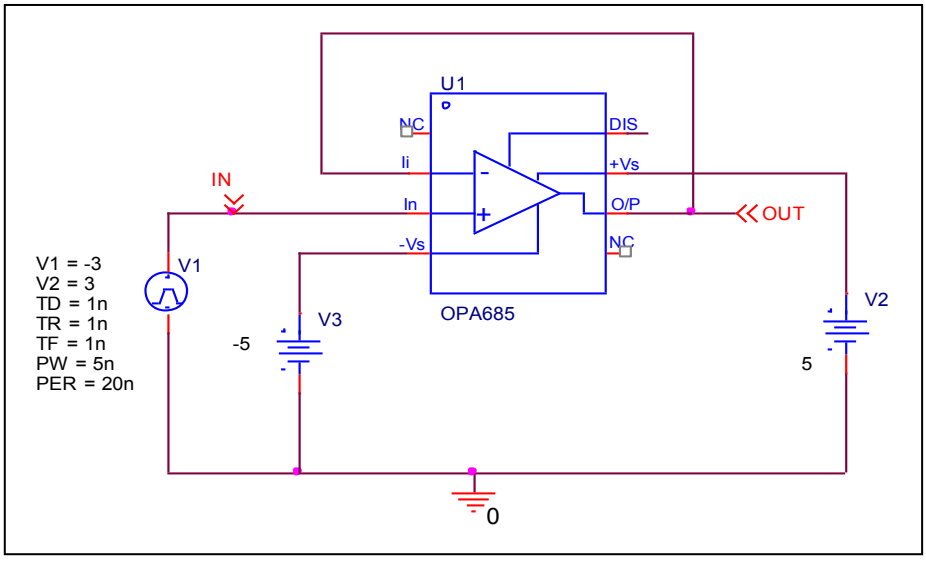
Input offset Voltage	Measurement	Simulation	%Error
V_{os} (mV)	1.7	1.7072	0.424

Slew Rate

Simulation result



Evaluation Circuit

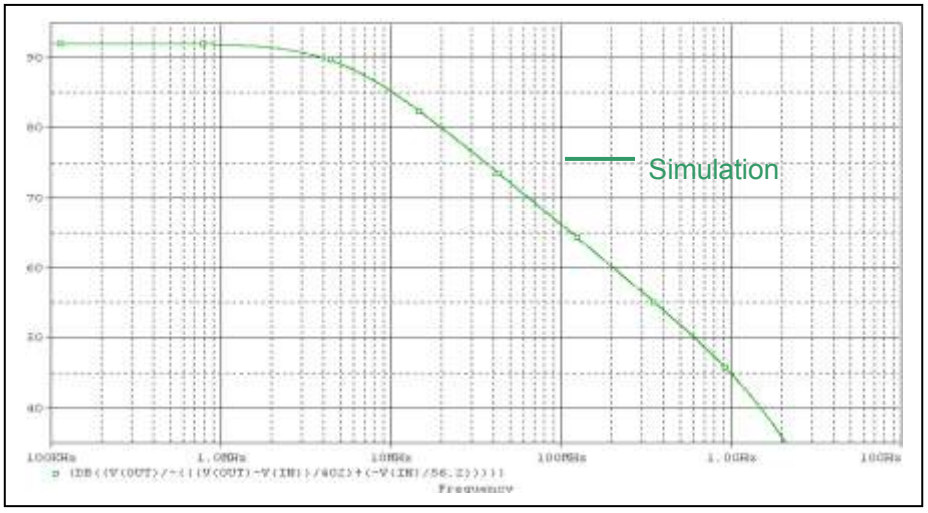


Comparison Table

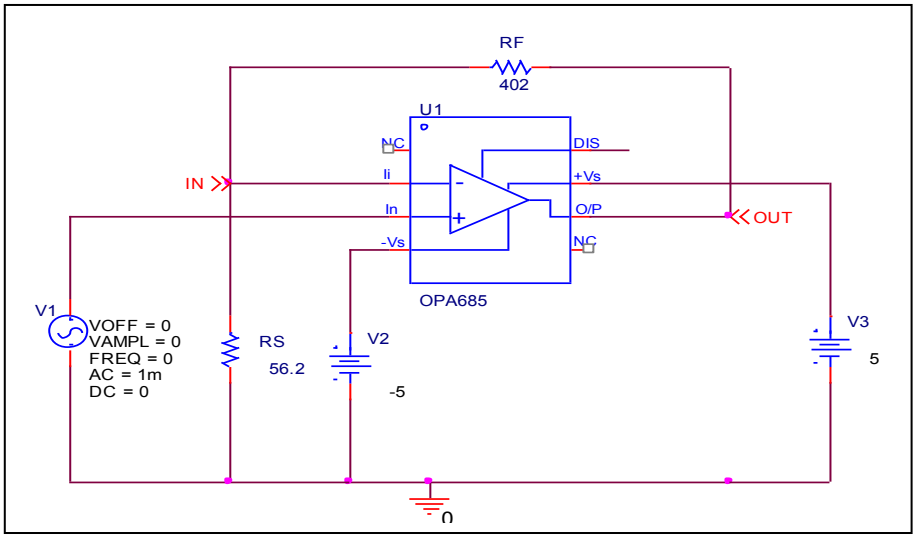
Slew Rate	Measurement	Simulation	%Error
SR (V/us)	4200	4146.22	-1.280

Open loop Transimpedance Gain

Simulation result



Evaluation Circuit



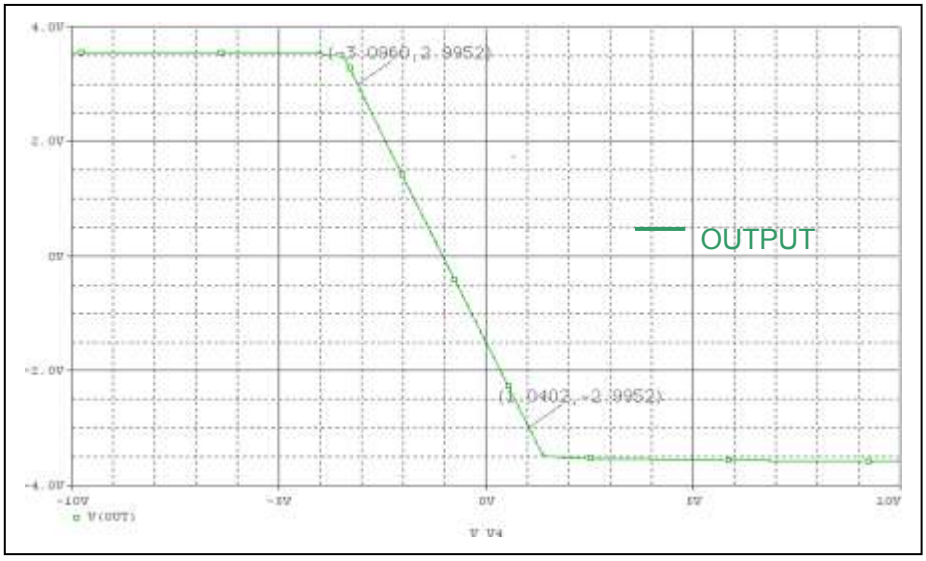
$$|Z_{OL}| = Vo \Big/ -\left\{\frac{Vo-(Vin-)}{Rf}+\left(\frac{-Vin-}{Rs}\right)\right\}$$

Comparison Table

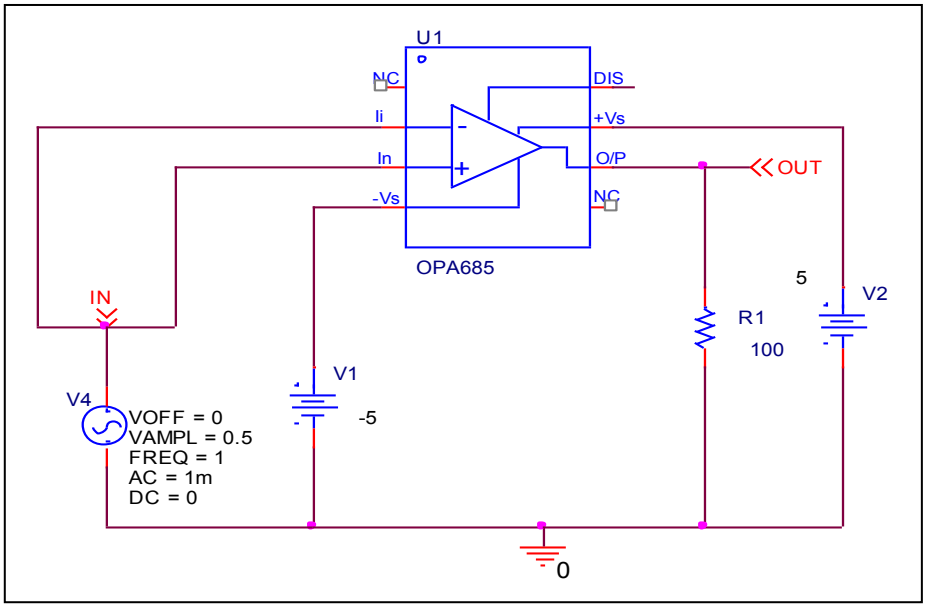
	Measurement	Simulation	% Error
$\|Z_{OL}\|$(dBΩ)	92	92.041	0.045
At Z_{OL}=35dBΩ, Ft (GHz)	2	2.0927	4.635

Common-Mode Rejection Ratio

Simulation result



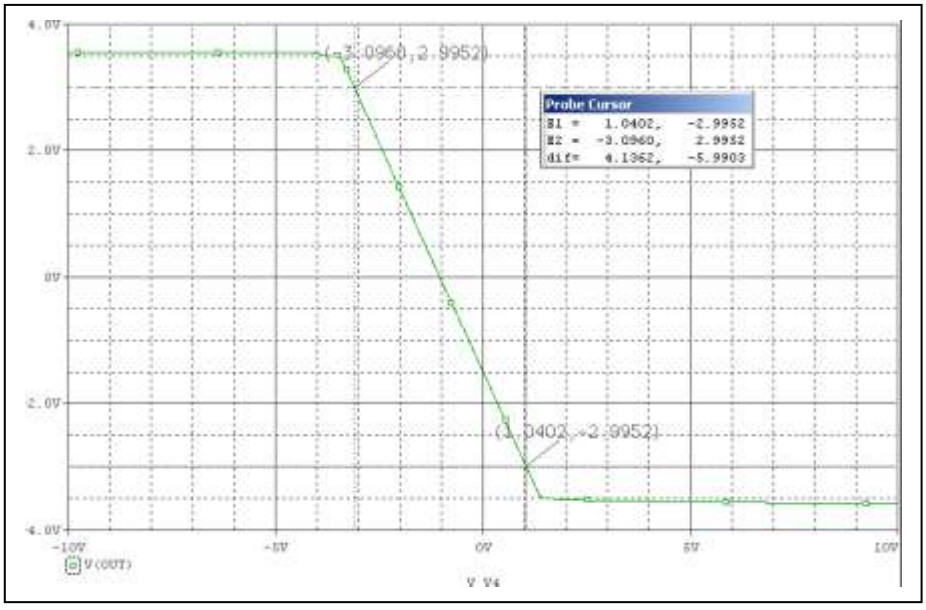
Evaluation Circuit



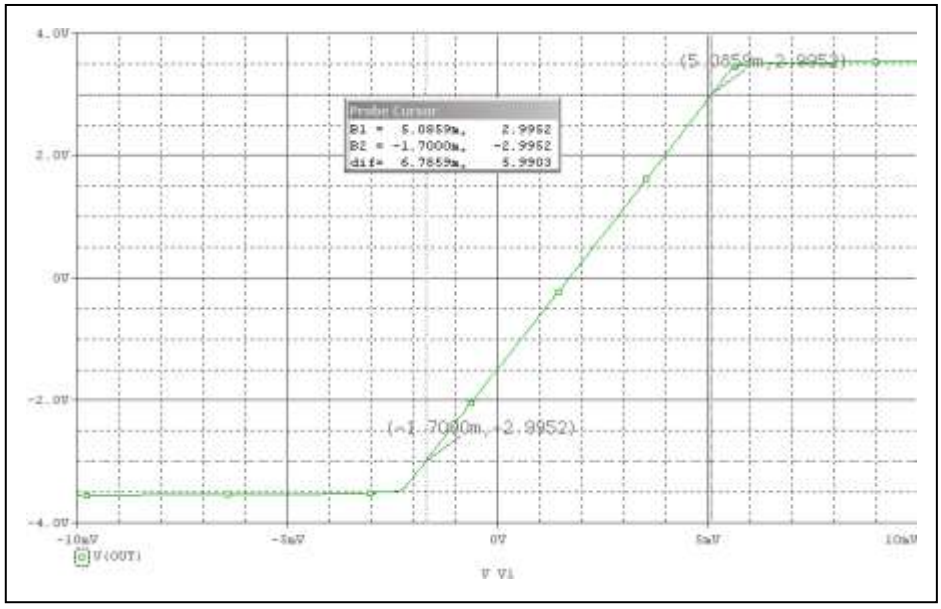
Comparison Table

	Measurement	Simulation	% Error
CMRR (dB)	54	55.699	3.146

ACM



AV = Slope of output voltage swing



$$CMRR = 20 * LOG\left(\frac{AV}{ACM}\right)$$

$$AV = \frac{Vo}{(Vin+)-(Vin-)} \quad = \quad \frac{5.9903}{6.7859m}$$

$$ACM = \frac{Vo}{VCM} \quad = \quad \frac{5.9903}{4.1362}$$

$$CMRR = 20 * LOIG\left\{\left(\frac{Vo}{(Vin+)-(Vin-)}\right) * \left(\frac{VCM}{Vo}\right)\right\}$$

$$CMRR = 20 * LOG\left(\frac{VCM}{(Vin+)-(Vin-)}\right)$$

$$= \quad 20 * LOG\left(\frac{4.1362}{6.7859m}\right) \quad = \quad 55.699 \text{ dB}$$